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ABSTRACT

The present invention discloses the fabrication of polymer-coated, coated fiber composites, hybrid composites and a method and apparatus for fabricating the same. The invention provides for the maximum spraying and coating of a roving of coated fibers with molten polymer streams without making physical contact with a solid media, thus simultaneously preventing the fiber surface from getting damaged and stripping off the coating. When metal-coated fiber is used the invention improves the electromagnetic shielding properties of any subsequent product made from the inventive composite. The method and apparatus of the present invention uses sets of nozzle-type sprayers having multiple orifices to enable the thermoplastic or thermoset polymer to penetrate more efficiently into the fiber bundle, thereby providing a more uniform coverage of all fibers. The hybrid composites can consist of two or more types of reinforcements and one or more type of matrix polymer.